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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,346	09/22/2003	Yujin Yamazaki	826.1895	7037
21171	7590	09/10/2004	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

20

Office Action Summary	Application No.	Applicant(s)	
	10/665,346	YAMAZAKI ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9/22/03, 3/11/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

The phrase “a first multi-layer film with a first refractive index” and the phrase “a second multi-layer film with a second refractive index” recited in claim 1 are *completely confusing and indefinite* since it is really not clear if in each of the phrases, it means there is a *single film* having a first (or a second) refractive index or a *multi-layer film* (i.e. a *plural layers of film*). It is really not clear if each of the films has a multi-layer structure, that is to say with more than one film, then how can it have a **single** refractive index. On the other hands if each film is just a single layer film, what then is the meaning of the term “multi-layer”. The scopes of the claims are really unclear and indefinite.

The phrase “the distortion of the substrate that is due to the difference in stress between the first and second multi-layer films formed on the first and second films, respectively” recited in claim 1 is very confusing and indefinite since it is not clear what stress and distortion are concerned here and *where* are these stress and distortion occurs.

The phrase “almost the same” recited in claim 6 is not clear and indefinite since it is not clear to what degree the term “almost” should be considered.

The features concerning the “*fixing material*” recited in claims 6-13 are confusing and indefinite since the claims lack a structural relationship and *logical* relationship between the fixing material and the optical device to define an operable and definite optical system. At this juncture the limitations

Art Unit: 2872

concerning the fixing material can only broadly interpreted as one can arbitrarily adhered the optical device to any other element.

Clarifications are required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Shirasaki (PN. 5,930,045) in view of the patent issued to Fujii (PN. 5,424,876).**

Shirasaki teaches a *virtual imaged phased array* (VIPA) that is comprised of a *substrate* (164, Figures 12(A)) and a *first reflecting film* (166) placed on a first surface of the substrate and a *second reflecting film* (168) placed on a second surface of the substrate. The two reflecting films each comprises at least one layer and implicitly has a first and second refractive index. Since the term “multi-layer film” is not definitely defined here, (for the reasons stated above), it cannot be addressed here.

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the VIPA has a *stress correction film* formed on one of the reflecting films. Fujii in the same field of endeavor teaches to use a *silicon dioxide layer* in a *multi-layer mirror* such that the silicon dioxide layer imposes a compressive stress on the substrate of the multi-layer mirror such that the stress on the substrate resulted from all the other multi-layer films in the mirror may be reduced, (please see column 2, lines 1-49). It would then have been obvious to apply the teachings of Fujii to add a silicon dioxide layer to the VIPA as a stress correction layer for the benefit of reducing the possible damages or distortion to the substrate of the VIPA induced by the stress of the reflecting films and by the expansion of the substrate under high heat environment. With regard to claims 2-4, Fujii teaches that the stress

Art Unit: 2872

correction film is a silicon dioxide film and its thickness may be adjusted to properly reduce the stress. The thickness of the silicon dioxide film is also selected so that it *does not effect* the optical property of the multi-layer mirror. It is a well-known knowledge in the art that in a multi-layer film structure, in order for the layer not to effect the optical property the layer should have an optical thickness of half or multiple of half of the specific wavelength of interested in order for the light effected by the layer be completely out of phase. Such modification therefore is considered obvious to one skilled in the art so that the silicon dioxide layer will not effect the reflectivity of the reflective layers (166 or 168). The optical flatness of the substrate being within one wavelength or less is rather standard in the art for the purpose of reducing unwanted scattering of the light at the surface.

With regard to claim 5, Shirasaki teaches that the VIPA (240, Figures 17-20) may be utilized with a mirror (254) to realize a dispersion compensator.

With regard to claims 6-13, the features concerning the fixing material are not well defined for the reasons stated above. The scopes of the claims therefore are not clear. The features can only be broadly interpreted as the VIPA can be arbitrarily adhered to any elements as desired. **Shirasaki** teaches that the VIPA can be adhered or fixed onto to a protector plate (174, Figure 12(c) and 12(D)) using a transparent adhesive (172, please see column 10 liens 18-46). The protector plate then serves as the fixing material. Although this reference does not teach that the protector plate is made of the various materials claimed, such modifications would have been obvious to one skilled in the art for selecting desired materials as the protector plate to protect the VIPA in different environments as needed and desired. The fixing to the protector plate may be considered as optically jointed.

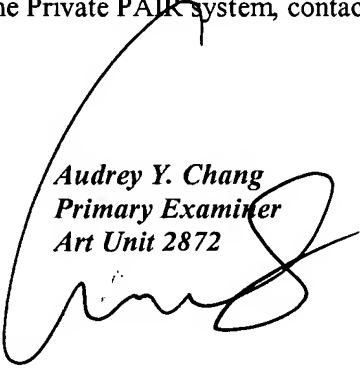
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

Art Unit: 2872

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang
Primary Examiner
Art Unit 2872



A. Chang, Ph.D.